

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 12 OCT 2005

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Applicant's or agent's file reference WO414-7437003		FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/EP2004/006376		International filing date (day/month/year) 14.06.2004	Priority date (day/month/year) 26.06.2003	
International Patent Classification (IPC) or national classification and IPC C10G47/16, C10G47/20				
Applicant HALDOR TOPS E AS				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 07.01.2005		Date of completion of this report 11.10.2005		
Name and mailing address of the International preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Deurinck, P Telephone No. +31 70 340-2404		



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/006376

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-35 as originally filed

Claims, Numbers

1-7 filed with telefax on 23.11.2004

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/006376

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-7
Inventive step (IS)	Yes: Claims	
	No: Claims	1-7
Industrial applicability (IA)	Yes: Claims	1-7
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: US 2002/0094931

D2: WO 97/20016

D3: US 5 350 501

Novelty

1. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent **Claim 1** is not new in the sense of Article 33(2) PCT.

Document D3 discloses a process for hydrocracking a hydrocarbon feedstock into a middle distillate in the presence of hydrogen comprising contacting the feedstock at a temperature between 232 °C and 454 °C and a pressure between 51 atm and 238 atm with a catalyst comprising a beta zeolite and a Y zeolite, the Y zeolite having a unit cell size of 24.20 Å and a molar ratio $\text{SiO}_2:\text{Al}_2\text{O}_3$ of from 4.5 to 35, the beta zeolite having a silica-alumina ratio of up to 500 (see D3: claim 1; Table 1; column 4, lines 3-16; column 5, lines 38-58).

The subject-matter of independent Claim 1 differs from documents D1 and D2 in that the beta zeolite has a silica-alumina ratio of at least 250 (see D1: Table 6; claim 1; see D2: claim 1; page 6, line 34 - page 11, line 26; Example 1). It is however not clear which technical effect might be achieved with this high silica-alumina ratio.

2. The following dependent Claims are also not new:
 - **Claim 2:** see D3: claim 1;
 - **Claim 3:** see D3: claim 9;
 - **Claim 4:** see D3: column 8, lines 45-68;
 - **Claim 5:** see D3: column 7, lines 18-37;

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

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- **Claim 6:** see D3: column 6, line 56 - column 7, line 18;
- **Claim 7:** see D3: column 14, lines 15-24.

**Replacement page****NEW CLAIMS**

1. A process for hydrocracking a hydrocarbon feedstock into a low aromatic content middle distillate in the presence of hydrogen comprising contacting the feedstock with a catalyst comprising a beta zeolite and a Y zeolite at elevated temperature and pressure of 260-430°C and 5-20MPa, the Y zeolite having a unit cell size below 24.40 Å and a molar $\text{SiO}_2:\text{Al}_2\text{O}_3$ ratio of at least 15, the beta zeolite having a silica-alumina ratio of at least about 250.

2. The process of claim 1, wherein the Y zeolite has a unit cell size below 24.30 Å.

3. The process of claim 1, wherein the hydrocracking catalyst composition further comprises one or more hydrogenation components selected from nickel, cobalt, molybdenum, tungsten and chromium, their oxides and sulphides.

4. The process of claim 3 wherein the hydrogenation component is selected from nickel and tungsten, their oxides and sulphides.

5. The process of claim 1, wherein the said catalyst composition further comprises at least one amorphous component selected from the group comprising silica, alumina, titania, zirconium and their binary and tertiary compounds.

**Replacement Page**

6. The process of claim 1, wherein the catalyst is in form of a physical mixture of beta zeolite and Y zeolite particles.

7. The process of any of the above claims in which the hydrocarbon feedstock has been subjected to hydrotreating so as to reduce its organic nitrogen and sulphur content.